Docket No.: 04558/053001
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Shoji Nakamura et al.

Application No.: 09/911,855 | Confirmation No.: 3890

Filed: July 23, 2001 | Art Unit: 1745

For: MOLDED GLASS SUBSTRATE FOR MAGNETIC DISK AND METHOD FOR MANUFACTURING THE SAME | Examiner: J. J. Rhee

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Claims 1-8 are pending in this application. Claim 1 is independent. The remaining claims depend, directly or indirectly, from claim 1. Claims 1-5 and 8 stand rejected as anticipated by U.S. Patent No. 6,537,648 (hereinafter "Takahashi"). Claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being obvious over Takahashi in view of U.S. Patent No. 3,660,061 issued to Donley *et al.* (hereinafter "Donley").

Appellant respectfully asserts that in maintaining the above rejections and issuing an advisory action, the Examiner has failed to satisfy the requirements set forth in MPEP § 2143. Specifically, to establish a *prima facie* case of obviousness, "the prior art reference (or references when combined) must teach or suggest *all the claim limitations*" (emphasis added).

The invention described in the application relates to a molded glass substrate and a method for making the molded glass substrate. Figure 1 illustrates a molded glass substrate in accordance with one embodiment of the invention.

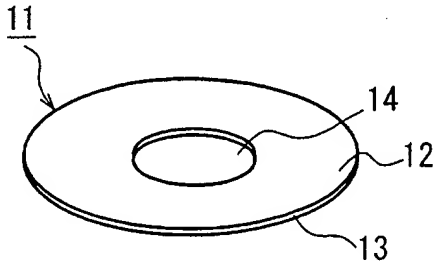

Figure 1 – Molded Glass Substrate

As seen in Figure 1, the molded glass substrate (11) includes upper and lower principal surfaces (both denoted by reference (12)), an outer surface (13) joining the upper and lower principal surfaces (12), and an inner surface (14). The upper and lower principal surfaces (12) have a mirror surface property and the outer surface (13) has a molding-free face property. (*See, e.g.,* Specification, page 7, lines 32-37). The mirror surface property of the upper and lower principal surfaces (12) corresponds to a surface that is essentially free of surface deviations (quantified by small waviness) and free of scoring. (*See, e.g.,* Specification, page 8, line 32 – page 9, line 5). Surface deviations and scoring are typically the result of grinding and polishing the upper and lower principal surfaces of a glass substrate, both of which are not performed in the invention. Further, the mirror surface property includes a transcribed property. Specifically, the surface properties present on the molding die (*i.e.,* the precision planar processing members (22) and (23) in Figure 2 below) are *faithfully transcribed* onto the upper and lower principal surfaces (12) during the molding process. (Specification, page 7, line 32 – page 8, line 5).

The molding-free face property of the outer surface (13) corresponds to a surface that is *not* processed in any way, in order to achieve the end product. Specifically, the outer surface (13) does not come in contact with the mold or with any mechanism that would alter the characteristics of the surface. The extent of surface smoothness inherent in the molding-free face may be observed by viewing the surface with a scanning electron microscope (SEM). In the case of a ground and polished glass surface, fine marks resulting from grinding and polishing may be observed under an SEM. On the other hand, the molding-free face is a smooth surface that does not include such imperfections when viewed under the SEM. (Specification, page 4, lines 7-12). Both the mirror surface property of the upper and lower principal surfaces (12) and the molding-free face property of the outer surface are a result of the molding process.

To produce the molded glass substrate discussed above, two precision planar processing members (22, 23) are manufactured such that the surfaces which are to come in to contact with the glass material during the molding process have the desired average surface roughness, small waviness, flatness, and any other additional properties the manufacturer would like to transcribe onto the upper and lower principal surfaces (12) of the molded glass substrate (11). (Specification, page 8, lines 11-18). The precision planar processing members (22, 23) are then combined with a barrel die (24) to produce a molding block (21), as shown in Figure 2 reproduced below.

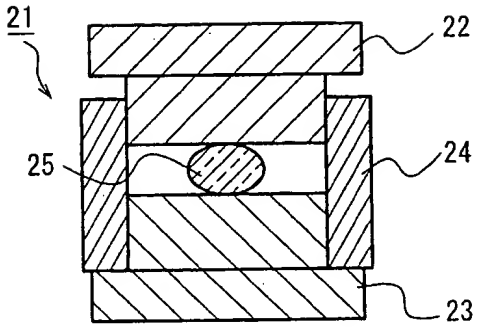

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Figure 2-Molding Die

Glass material (25) is then inserted into the molding block (21). The volume of glass material (25) inserted into the molding block (21) is determined such that the resulting molded glass substrate (11) has a particular outer diameter, within a specified dimensional tolerance. In addition, the volume of glass (25) is determined such that the when the glass material is being molded, the outer surface does not come into contact with the barrel die (24). Further, the thickness of the resulting molded glass substrate is determined by adjusting the barrel die (24) size (Specification, page 8, lines 1-4).

The glass material (25) is subsequently heated within the molding die (21), via heaters embedded within the precision planar processing members (22, 23). The glass material (25) is heated until the heaters reach a predetermined temperature (typically above the softening point of the glass material (25)). Pressure (P) is subsequently applied to bring the precision planar processing members (22, 23) in to contact with the barrel die (21). The heaters are subsequently turned off, and the entire molding block (21) is cooled while maintaining pressure (P). After being sufficiently cooled, the molding die (21) is disassembled to provide a molded glass substrate. (Specification, page 8, lines 18-31). After the molded glass substrate has been removed from the molding die (21), a core drill and a chamfer are used to make the inner surface (14) (Specification, page 10, line 30 – page 13, line 13).

While the process of manufacturing the molded glass substrate has been described with respect to a single temperature and pressure sequence, additional temperature and pressure sequences may also be used to produce the molded glass substrate (*See e.g.,* Specification, page 9, lines 7 – page 10, line 29).

Advantages of the invention include reducing industrial waste products and reducing cost of manufacture because a precision molding process is used. A glass substrate is manufactured using a small number of steps to reduce industrial waste. A low cost is achieved by reducing the number of manufacturing processes required to produce the substrate. Furthermore, the invention allows the outer circumference to be formed as a molding-free face, so that a surface property equivalent to that of a polished surface can be provided. This makes it possible to suppress the generation of dust from the glass itself and eliminate the need for chamfering. (*See, e.g.,* Specification, page 3, line 6-15).

Independent claim 1 recites, in part: "wherein the outer surface is a molding-free face." In view of the above, it is clear that a molding-free face has a smooth, mirror-finished surface that requires no surface finishing, *and is physically distinguishable from a molded surface or a ground surface*, which contains marks from molding, grinding, polishing, *etc.* (*see, e.g.*, publication of the Specification, paragraphs [0021], [0044]). Appellant has clearly defined the limitation "molding-free face" in the prosecution history. For example, in the declaration submitted December 30, 2005, a molding-free face is defined as "*a surface that is smooth* due to not being formed with a mold, and, resultantly, *is lacking grinding or chamfering marks.*" This meaning is used consistently throughout the specification (*see, e.g.*, publication of the Specification, paragraph [0021]). Thus, it is improper to characterize this limitation as a product-by-process limitation when those skilled in the art clearly appreciate that there exist *actual physical differences* between molding-free face and molded surfaces or ground surfaces.

Appellant has further requested, in accordance with 37 C.F.R §104(d)(2), that the Examiner set forth any specific knowledge she has with respect to this art in the form of a declaration that may be appropriately cross-examined and rebutted. The Examiner has declined to respond with any declaration of specific personal knowledge and, thus, all evidence in the record supports the Appellant's position that the limitation is a positive structural limitation and not a product-by-process limitation. Accordingly, it is improper for the Examiner to maintain that position without any appropriate basis therefor.

It would be clear to one skilled in the art that Takahashi does not disclose *an outer surface that is a molding-free face* as required by the claimed invention. In clear contrast to the claimed invention, Takahashi discloses obtaining a disk-shaped glass substrate through the use of multiple dies or from cutting. Takahashi clearly teaches the use of grinding to form an end face. Takahashi explicitly states: "...an outer peripheral end face was ground to reduce the

diameter to 65 mm," and that "the outer peripheral end face and an inner peripheral surface were subjected to predetermined chamfering" (*see* Takahashi, col. 14, line 64 – col. 15, line 1). As discussed above, a ground or chamfered surface contains marks from the grinding or chamfering that are not present on a molding-free face. Thus, the end surface of Takahashi has grinding or chamfering marks and, accordingly, Takahashi does not disclose an outer surface that is a molding-free face as required by the claimed invention.

Furthermore, Donley does not show or suggest all the limitations of independent claim 1 or supply that which Takahashi lacks. In contrast to the claimed invention, Donley is directed to producing a coated sheet of glass to provide desired properties to the glass. Donley is completely silent with respect to an outer surface that is a molding-free face, as required by independent claim 1 of the invention.

Conclusion

In view of the above, the Examiner has failed to satisfy the requirements set forth in MPEP § 2143. The cited references, whether considered separately or in combination, do not teach or suggest *all the claim limitations*. Accordingly, a favorable decision from the panel is respectfully requested.

Dated: September 5, 2006

Respectfully submitted,

By _____

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